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EXAMINER	
CAMPOS, YAIMA	
ART UNIT	PAPER NUMBER
2185	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/655,948	NOURMOHAMADIAN ET AL.	
	Examiner	Art Unit	
	Yaima Campos	2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *17 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

RESPONSE TO AMENDMENT

1. The examiner acknowledges the applicant's submission of the amendment dated November 17, 2006. At this point claim 14 has been cancelled and claims 16-24 have been added (Claims 1-13 and 15 were cancelled by amendment dated March 6, 2006). There are 9 claims pending in the application; there are 3 independent claims and 6 dependent claims, all of which are ready for examination by the examiner.

I. OBJECTIONS TO THE SPECIFICATION

2. **Claims 20 and 23** are objected to for the following informalities:

3. Claim 20 refers to the "method according to claim 20." It is believed that claim 20 was intended to refer to the "method" of claim 19 and has been treated as such for the rest of this Office action. Accordingly, applicant might consider changing the dependency of claim 20 from claim 20 to claim 19.

4. As per claim 23, this claim duplicates the preamble; thereby reciting "The virtual tape stacker according to claim 22 further comprising:" twice.

5. Appropriate correction is required.

II. REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 16-24** are rejected under 35 U.S.C. 102(b) as being anticipated by Keele et al. (US 5,455,926).

8. **Claim 16**, Keele discloses a virtual tape stacker comprising: **["an optical disk system and method for emulating a set of magnetic tape drives using virtual tape data stored on optical disks" (Col. 17, lines 60-64)]**

a server interface adapted to communicate with a server; " **[Item 12; IBM Mainframe Computer (Figure 1) "MOST 10 provides a transparent interface between IBM System 370 compatible mainframes 12 and optical disks 10" (Column 22, lines 41-44)]**

a random access data storage device; **[set of "optical disk drives 16a-16b" (Figure 1 and related text; Col. 18, lines 18-20)]**

a data path adapted to communicate with the random access data storage device; and **[Data path shown from port 17 Optical disk drive 16a (Figure 1)]**

a controller configured to transfer data between the server interface and the random access data storage device via the data path; **[MOST Controller 14 (Figure 1)]**

wherein the controller manages the data on the random access data storage device as a plurality of virtual tape volumes, **["MOST records a collection of virtual tapes on optical disks. The emulation process stores "virtual tapes" on the optical disks" (Col. 20, lines 32-41)]**

wherein the controller defines a virtual tape drive for transferring data between the server and the virtual tape volumes, **["each disk cartridge can be visually identified by a disk number and serial number directed on the optical disk of all the virtual tapes recorded on the optical disk" (Col. 20, lines 32-41)]**

wherein the controller defines a sequential order for loading the virtual tape volumes into the virtual tape drive, and **[Keele discloses this limitation as "MOST records a collection of virtual tapes on optical disks. The emulation process stores "virtual tapes" on the optical disks" (Col. 20, lines 32-41) wherein "each optical disk contains one or more virtual tapes" (Col. 40, lines 5-6) and explains "the optical disk 20 is made up of one-thousand-and-twenty-four byte sectors. These sectors can be written and read sequentially from the start of the optical disk through to the end" (Col. 40, lines 64-67); therefore, writing/storing virtual tapes in sequential order within optical drives. Furthermore, refer to Figure 5 where Keele illustrates "Tape directory" having virtual tapes stored in sequential order as "virtual tape # 1 (324a), virtual tape #2 (324b)... virtual tape #N (324c)." Keele also discloses (Tape Directory Format Table) which illustrates a "first sector information" having a "first VT" stored within bytes 16-31, and a "second VT" stored within bytes 32-47; therefore, storing virtual tapes in a sequentially within optical disks]**

wherein, in response to an eject command from the server, the controller unloads one of the virtual tape volumes from the virtual tape drive and loads a next consecutive one of the virtual tape volumes into the virtual tape drive according to the sequential order **[With respect to this limitation, Keele discloses "MOST reduces operator labor due to the automatic mounting and dismounting of virtual tapes" (Col. 20, lines 12-13) wherein "one key press will ready a drive, or rewind or unload a virtual tape" (Col. 36, lines 55-58) and explains "one a virtual tape is mounted from those available on a given disk 20, no other virtual tapes on that disk may be accessed by the mainframe until the first virtual tape is dismounted" (Col. 40, lines 5-11). Keele also discloses virtual tapes/data are written/read to optical disks sequentially**

(Col. 20, lines 32-41 and Col. 40, lines 64-67); therefore, being able to read/mount a next virtual tape or any virtual tape stored within optical disks. Keele specifies "the tape directory 318 comprises an ID Byte 322, tape data 324a, 324b through 324c for each virtual tape, and a continuation byte pointer 326" (Col. 43, lines 42-44) and is used to identify virtual tapes on a disk (Col. 43, lines 58-60) (Also see Col. 44, lines 5-67)].

9. As per **claim 17**, Keele discloses the virtual tape stacker according to claim 16 further comprising:

a volume management table residing on the random access data storage device and accessible by the controller, the volume management table having pointers to the virtual tape volumes; **[Keele discloses that "the controller 14 stores tape maps of the virtual tapes mounted in each optical drive" and further explains that a tape map "pointer points to a respective tape map 348 of each virtual tape"(Column 44, lines 5-6; Col. 20, line 67-Col. 21, line 6)]**

and a virtual tape manager residing on the controller that accesses the pointers so as to determine the next consecutive one of the virtual tape volumes **[With respect to this limitation, Keele teaches a tape directory which "points to a tape map for each virtual tape" (Column 40, line 38), that the MOST controller uses the system of pointers to "seek addresses on the optical disk" (Column 40, lines 45-46). Keele also discloses the "recording of updated tape directories for virtual tapes that were added, deleted or altered" (Column 20, lines 61-66) and further explains that "the tape map, stored for each virtual tape on the optical disk, is used to keep track of where on the disks 20 each record is stored." (Column 41, lines 22-25) (Figure 1). Keele also discloses virtual tapes/data are written/read to optical disks sequentially (Col. 20, lines 32-41 and Col. 40, lines 64-67); therefore, being able to**

reading/mount a next virtual tape. Therefore, MOST controller is able to access tape directory having pointers to tapes maps to determine the next consecutive virtual tape volume or the location of any tape volume within optical disks].

10. As per **claim 18**, Keele discloses the virtual tape stacker according to claim 17 further comprising:

a physical tape device; **["MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19, lines 2-15) which comprise cartridge tape drives which correspond to physical tape devices]**

and a tape cartridge loadable into the physical tape device, **["MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19, lines 2-15) which comprise cartridge tape drives having loadable tapes (Col. 18, lines 12-26)]**

wherein a physical tape volume corresponding to the tape cartridge is integrated into the virtual tape volume storage rotation **[With respect to this limitation, Keele discloses "MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19, lines 2-15) which comprise tape cartridge tape drives having loadable tapes and explains "the moving existing data from magnetic tape to optical disks... conversion to the optical media requires that data be transferred from magnetic tape. This can be accomplished by copying existing data from tape to optical storage" (Col. 19, lines 2-29) wherein "each optical disk contains one or more virtual tapes" (Col. 40, lines 5-6) and explains "the optical disk 20 is made up of one-thousand-and-twenty-four byte sectors. These sectors can be written and read sequentially from the start of the optical disk through to the end" (Col. 40, lines 64-67)].**

11. As per **claim 19**, Keele discloses a virtual tape stacker method comprising:

providing a plurality of virtual tape volumes on a random access storage device; [**"an optical disk system and method for emulating a set of magnetic tape drives using virtual tape data stored on optical disks" (Col. 17, lines 60-64; Col. 18, lines 18-20)]**

defining a virtual tape drive in a volume management table located on the random access storage device; identifying the virtual tape volumes in a plurality of data management tables located on the random access storage device; storing in the volume management table a plurality of pointers to the data management tables so as to identify the location of the virtual tape volumes; and **["each virtual tape that was recorded on a disk has associated with it a respective tape map. The tape directory listing the virtual tapes has pointers to the respective tape maps. The tape maps keep track of the physical structure of the virtual tapes"(Col. 20, line 67-Col. 21, line 6)]**

predetermining an access order for the pointers so as to define a sequential order for loading the virtual tape volumes into the virtual tape drive in response to eject commands from a server **[With respect to this limitation, Keele discloses "the optical disk 20 is made up of one-thousand-and-twenty-four byte sectors. These sectors can be written and read sequentially from the start of the optical disk through to the end" (Col. 40, lines 64-67); therefore, writing/storing virtual tapes in sequential order within optical drives. Furthermore, refer to Figure 5 where Keele illustrates "Tape directory" having virtual tapes stored in sequential order as "virtual tape # 1 (324a), virtual tape #2 (324b)... virtual tape #N (324c)." Keele also discloses (Tape Directory Format Table) which illustrates a "first sector information" having a "first VT" stored within bytes 16-31, and a "second VT" stored within bytes 32-47; therefore, storing virtual tapes in a sequentially within optical disks.**

Keele discloses "MOST reduces operator labor due to the automatic mounting and dismounting of virtual tapes" (Col. 20, lines 12-13) wherein "one key press will ready a drive, or rewind or unload a virtual tape" (Col. 36, lines 55-58) and explains "one a virtual tape is mounted from those available on a given disk 20, no other virtual tapes on that disk may be accessed by the mainframe until the first virtual tape is dismounted" (Col. 40, lines 5-11). Because Keele is able to mount/dismount any virtual tape written on optical disks defined within Tape Directory, and because Keele explains that optical disks can be written and read sequentially, Keele's invention is able to load/unload a virtual tape that is next in the sequential order in which tapes are written to optical disks. Keele further provides a greater advantage as Keele's invention is able to load any virtual tape written on optical disks by using random search. Refer to (Col. 29, lines 48-60; Col. 36, lines 18-60) wherein Keele teaches having a system of jukeboxes which store optical disks that contain virtual tapes on physical slots and explains that one drive (which contains a currently loaded virtual tape) is unloaded at the same time another drive is being loaded wherein optical disks are written sequentially but can be searched/read in sequential or random order].

12. As per **claim 20**, Keele discloses the virtual tape stacker method according to claim 20 further comprising:

reading one of the pointers according to the access order; **[[With respect to this limitation, Keele discloses that when a virtual tape is "mounted, the tape map is read and if it has been altered, is written onto the disk" and "the pointer to the tape map is recorded in the tape directory for each virtual tape" (Column 44, lines 48-52) as a way of accessing, reading and updating pointers every time a virtual volume is loaded on a disk]**

locating one of the data management tables according to the read pointer; and **[With respect to this limitation, Keele teaches a tape directory which "points to a tape map for each virtual tape" (Column 40, line 38)]**

addressing a next consecutive one in the sequential order of the virtual tape volumes according to the located one of the data management tables **[Keele discloses that the MOST controller uses the system of pointers to "seek addresses on the optical disk" (Column 40, lines 45-46). Keele also discloses the "recording of updated tape directories for virtual tapes that were added, deleted or altered" (Column 20, lines 61-66) and further explains that "the tape map, stored for each virtual tape on the optical disk, is used to keep track of where on the disks 20 each record is stored." (Column 41, lines 22-25) (Figure 1). Keele also discloses virtual tapes/data are written/read to optical disks sequentially (Col. 20, lines 32-41 and Col. 40, lines 64-67); therefore, being able to read/mount a next virtual tape. Therefore, MOST controller is able to access tape directory having pointers to tapes maps to determine the next sequentially consecutive virtual tape volume or the location of any tape volume within optical disks by random allocation. Optical disks are written sequentially and can be read/accessed sequentially or randomly]**.

13. As per **claim 21**, Keele discloses the virtual tape stacker method according to claim 20 further comprising:

providing a physical tape volume loaded on a physical tape device; and **["MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19, lines 2-15) which comprise cartridge tape drives which correspond to physical tape devices]**

integrating the physical tape volume in a storage rotation of the virtual tape volumes [**With respect to this limitation, Keele discloses "MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19, lines 2-15) which comprise tape cartridge tape drives having loadable tapes and explains "the moving existing data from magnetic tape to optical disks... conversion to the optical media requires that data be transferred from magnetic tape. This can be accomplished by copying existing data from tape to optical storage" (Col. 19, lines 2-29) wherein "each optical disk contains one or more virtual tapes" (Col. 40, lines 5-6) and explains "the optical disk 20 is made up of one-thousand-and-twenty-four byte sectors. These sectors can be written and read sequentially from the start of the optical disk through to the end" (Col. 40, lines 64-67)**].

14. As per **claim 22**, Keele discloses a virtual tape stacker comprising:

a plurality of virtual tape volumes configured on a random access data storage device; [**"an optical disk system and method for emulating a set of magnetic tape drives using virtual tape data stored on optical disks" (Col. 17, lines 60-64; Col. 18, lines 18-20)**]

a virtual tape drive defined by a controller in communications with the random access data storage device; [**"MOST records a collection of virtual tapes on optical disks. The emulation process stores "virtual tapes" on the optical disks" (Col. 20, lines 32-41)**]

a virtual tape manager configured on the controller so as to transfer data between one of the virtual tape volumes loaded into the virtual tape drive and an application program, " [**"MOST has an advanced controller capable of data streaming" (Column 19, lines 57-58) "The emulation process stores virtual tapes on the optical disks" (Column 20, lines 33-34). Keele also discloses that "Mount Messages sent by the attached host computer 12 to MOST 10**

are automatically interpreted and acted" (Figure 1, Column 36, lines 31-32). It is inherent that in order for a host computer to send messages, it must have an application program with one or more instructions readable and executable by a processor and also have a medium to transfer data]

wherein the virtual tape manager indicates a sequential order for loading a next consecutive one of the virtual tape volumes into the virtual tape drive upon ejection of the loaded one of the virtual tape volumes **[With respect to this limitation, Keele discloses "the optical disk 20 is made up of one-thousand-and-twenty-four byte sectors. These sectors can be written and read sequentially from the start of the optical disk through to the end" (Col. 40, lines 64-67); therefore, writing/storing virtual tapes in sequential order within optical drives. Furthermore, refer to Figure 5 where Keele illustrates "Tape directory" having virtual tapes stored in sequential order as "virtual tape # 1 (324a), virtual tape #2 (324b)... virtual tape #N (324c)." Keele also discloses (Tape Directory Format Table) which illustrates a "first sector information" having a "first VT" stored within bytes 16-31, and a "second VT" stored within bytes 32-47; therefore, storing virtual tapes in a sequentially within optical disks. Keele discloses "MOST reduces operator labor due to the automatic mounting and dismounting of virtual tapes" (Col. 20, lines 12-13) wherein "one key press will ready a drive, or rewind or unload a virtual tape" (Col. 36, lines 55-58) and explains "one a virtual tape is mounted from those available on a given disk 20, no other virtual tapes on that disk may be accessed by the mainframe until the first virtual tape is dismounted" (Col. 40, lines 5-11). Because Keele is able to mount/dismount any virtual tape written on optical disks defined within Tape Directory, and because Keele explains that**

optical disks can be written and read sequentially, Keele's invention is able to load/unload a virtual tape that is next in the sequential order in which tapes are written to optical disks. Keele further provides a greater advantage as Keele's invention is able to load any virtual tape written on optical disks by using random search. Refer to (Col. 29, lines 48-60; Col. 36, lines 18-60) wherein Keele teaches having a system of jukeboxes which store optical disks that contain virtual tapes on physical slots and explains that one drive (which contains a currently loaded virtual tape) is unloaded at the same time another drive is being loaded wherein optical disks are written sequentially but can be searched/read in sequential or random order].

15. As per **claim 23**, Keele discloses the virtual tape stacker according to claim 22 further comprising:

a volume management table maintained in the virtual tape manager, **[Keele discloses that "the controller 14 stores tape maps of the virtual tapes mounted in each optical drive" and further explains that a tape map "pointer points to a respective tape map 348 of each virtual tape"(Column 44, lines 5-6; Col. 20, line 67-Col. 21, line 6)]**

a plurality of pointers to the virtual tape volumes stored in the volume management table, **["each virtual tape that was recorded on a disk has associated with it a respective tape map. The tape directory listing the virtual tapes has pointers to the respective tape maps. The tape maps keep track of the physical structure of the virtual tapes"(Col. 20, line 67-Col. 21, line 6)]**

wherein the sequential order of loading the virtual tape volumes into the virtual tape drive is determined by an access order of the pointers **[With respect to this limitation, Keele discloses**

"the optical disk 20 is made up of one-thousand-and-twenty-four byte sectors. These sectors can be written and read sequentially from the start of the optical disk through to the end" (Col. 40, lines 64-67); therefore, writing/storing virtual tapes in sequential order within optical drives. Furthermore, refer to Figure 5 where Keele illustrates "Tape directory" having virtual tapes stored in sequential order as "virtual tape # 1 (324a), virtual tape #2 (324b)... virtual tape #N (324c)." Keele also discloses (Tape Directory Format Table) which illustrates a "first sector information" having a "first VT" stored within bytes 16-31, and a "second VT" stored within bytes 32-47; therefore, storing virtual tapes in a sequentially within optical disks. Keele discloses "MOST reduces operator labor due to the automatic mounting and dismounting of virtual tapes" (Col. 20, lines 12-13) wherein "one key press will ready a drive, or rewind or unload a virtual tape" (Col. 36, lines 55-58) and explains "one a virtual tape is mounted from those available on a given disk 20, no other virtual tapes on that disk may be accessed by the mainframe until the first virtual tape is dismounted" (Col. 40, lines 5-11). Because Keele is able to mount/dismount any virtual tape written on optical disks defined within Tape Directory, and because Keele explains that optical disks can be written and read sequentially, Keele's invention is able to load/unload a virtual tape that is next in the sequential order in which tapes are written to optical disks. Keele further provides a greater advantage as Keele's invention is able to load any virtual tape written on optical disks by using random search. Refer to (Col. 29, lines 48-60; Col. 36, lines 18-60) wherein Keele teaches having a system of jukeboxes which store optical disks that contain virtual tapes on physical slots and explains that one drive (which contains a currently loaded virtual tape) is unloaded at the same time another drive

is being loaded wherein optical disks are written sequentially but can be searched/read in sequential or random order].

16. As per **claim 24**, Keele discloses, the virtual tape stacker according to claim 23 further comprising:

a physical tape volume, **["MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19, lines 2-15) which comprise cartridge tape drives which correspond to physical tape devices]**

wherein a last one of the virtual tape volumes is previous to the physical tape volume in the sequential access order and a first one of the virtual tape volumes is next from the physical tape volume in the sequential access order **[With respect to this limitation, Keele discloses "MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19, lines 2-15) which comprise tape cartridge tape drives having loadable tapes and explains "the moving existing data from magnetic tape to optical disks... conversion to the optical media requires that data be transferred from magnetic tape. This can be accomplished by copying existing data from tape to optical storage" (Col. 19, lines 2-29) wherein "each optical disk contains one or more virtual tapes" (Col. 40, lines 5-6) and explains "the optical disk 20 is made up of one-thousand-and-twenty-four byte sectors. These sectors can be written and read sequentially from the start of the optical disk through to the end" (Col. 40, lines 64-67)]**. For example, when using optical storage in place of tapes, MOST writes virtual tapes to optical disks sequentially, when writing/copying a virtual tape from a magnetic tape which corresponds to a (physical tape volume) as claimed by Applicant, this (physical tape volume) is written after the virtual tape volume sequentially in optical disks and when continuing to use optical storage in

place of tapes, MOST writes virtual tapes to optical disks sequentially after writing (physical tape volume). Therefore, Keele implicitly discloses wherein a last one of the virtual tape volumes is previous to the physical tape volume in the sequential access order and a first one of the virtual tape volumes is next from the physical tape volume in the sequential access order. [**Applicant should note that because Keele is able to mount/dismount any virtual tape written on optical disks defined within Tape Directory (not just a virtual tape sequentially written after a currently loaded virtual tape), and because Keele explains that optical disks are written sequentially and can be accessed sequentially or randomly, Keele's invention is able to load/unload a virtual tape that is next in the sequential order in which virtual tapes are written to optical disks. Keele further provides a greater advantage as Keele's invention is able to load any virtual tape written on optical disks by using random allocation within optical disks. Refer to (Col. 29, lines 48-60; Col. 36, lines 18-60) wherein Keele teaches having a system of jukeboxes which store optical disks that contain virtual tapes on physical slots and explains that one drive (which contains a currently loaded virtual tape) is unloaded at the same time another drive is being loaded wherein optical disks are written sequentially but can be searched/read in sequential or random order**].

Claim Rejections - 35 USC § 103

17. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keele et al. (US 5,455,926) in view of Dailey et al. (US 2004/0098244).

18. As per **claim 24**, Keele discloses, the virtual tape stacker according to claim 23 further comprising:

a physical tape volume, [**"MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19, lines 2-15) which comprise cartridge tape drives which correspond to physical tape devices]**

wherein a last one of the virtual tape volumes is previous to the physical tape volume in the sequential access order and a first one of the virtual tape volumes is next from the physical tape volume in the sequential access order **[With respect to this limitation, Keele discloses "MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19, lines 2-15) which comprise tape cartridge tape drives having loadable tapes and explains "the moving existing data from magnetic tape to optical disks... conversion to the optical media requires that data be transferred from magnetic tape. This can be accomplished by copying existing data from tape to optical storage" (Col. 19, lines 2-29) wherein "each optical disk contains one or more virtual tapes" (Col. 40, lines 5-6) and explains "the optical disk 20 is made up of one-thousand-and-twenty-four byte sectors. These sectors can be written and read sequentially from the start of the optical disk through to the end" (Col. 40, lines 64-67)]**. For example, when using optical storage in place of tapes, MOST writes virtual tapes to optical disks sequentially, when writing/copying a virtual tape from a magnetic tape which corresponds to a (physical tape volume) as claimed by Applicant, this (physical tape volume) is written after the virtual tape volume sequentially in optical disks and when continuing to use optical storage in place of tapes, MOST writes virtual tapes to optical disks sequentially after writing (physical tape volume). Therefore, Keele implicitly discloses wherein a last one of the virtual tape volumes is previous to the physical tape volume in the sequential access order and a first one of the virtual tape volumes is next from the physical tape volume in the sequential access order. **[Applicant**

should note that because Keele is able to mount/dismount any virtual tape written on optical disks defined within Tape Directory (not just a virtual tape sequentially written after a currently loaded virtual tape), and because Keele explains that optical disks are written sequentially and can be accessed sequentially or randomly, Keele's invention is able to load/unload a virtual tape that is next in the sequential order in which virtual tapes are written to optical disks. Keele further provides a greater advantage as Keele's invention is able to load any virtual tape written on optical disks by using random allocation within optical disks. Refer to (Col. 29, lines 48-60; Col. 36, lines 18-60) wherein Keele teaches having a system of jukeboxes which store optical disks that contain virtual tapes on physical slots and explains that one drive (which contains a currently loaded virtual tape) is unloaded at the same time another drive is being loaded wherein optical disks are written sequentially but can be searched/read in sequential or random order].

To further detail Keele's disclosure, Dailey discloses incorporating physical tape volumes within virtual tape volumes [**Dailey discloses this concept as "library control unit 76 generates control signals to direct a robot arm 10 to retrieve the appropriate data tape cartridge from cartridge storage 82 and insert the data tape cartridge into one of drives 84" (Pages 6-7, paragraph 0080 and Figure 10) wherein "drives 84 may include one or more conventional tape drives and one or more tape drive emulators for receiving data tape cartridges housing non-tape storage media" (Page 7, paragraph 0084); "cartridges housing different types of media are mechanically indistinguishable by automation unit 78" (Page 7, paragraph 0082) and explains that "tape drive emulator 6 writes the data sequentially within the logical storage areas of non-tape storage medium 5" (Page 3,**

paragraph 0035). Therefore, the system described by Dailey discloses a tape drive emulator that contains "conventional tape cartridges" (physical volumes) and "non-tape storage media," (logical tape volumes) all stored within the same logical storage areas wherein data pertaining to a "conventional tape cartridge" or physical tape volume is stored within the same virtual space as "virtual tape volumes" that belong to "non-tape storage media," in sequential order]. Applicant should note that because Dailey clearly discloses **["the tape drive emulator sequentially records the data within the logical storage areas of the non-tape storage medium... maintains a library of tape marks on the storage medium to indicate locations within stored data files... the tape drive emulator makes use of the library of tape marks to access the non-tape storage medium in response to tape access commands form a host computing device" [(Abstract). Applicant should note that it is well known in the art that *emulation of magnetic tape devices on non-tape devices comprises creation of virtual/logical tapes;* therefore, disclosing emulation/virtual/logical areas in a non-tape device used to record information/virtual tapes, as claimed by Applicant]**.

Keele et al. (US 5,455,926) and Dailey et al. (US 2004/0098244) are analogous art because they are from the same field of endeavor of computer memory access and control.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the virtual tape stacker which writes virtual tape drives in sequential order into optical disks as disclosed by Keele with the tape emulation system which incorporates magnetic tape drives with tape drive emulators as taught by Dailey.

The motivation for doing so would have been because Keele teaches **[Keele discloses "MOST can be used alone or in conjunction with 3420 or 3480 tape subsystems" (Col. 19,**

lines 2-15) which comprise tape cartridge tape drives having loadable tapes and explains "the moving existing data from magnetic tape to optical disks... conversion to the optical media requires that data be transferred from magnetic tape" (Col. 19, lines 2-29). Dailey further teaches [**"a wide variety of storage media may be used within library automation system" (Page 7, Par. 0086)**].

Therefore, it would have been obvious to combine Dailey et al. (US 2004/0098244) with Keele et al. (US 5,455,926) for the benefit of creating a virtual tape stacker to obtain the invention as specified in claim 24.

III. ACKNOWLEDGMENT OF ISSUES RAISED BY THE APPLICANT

Response to Amendment

19. Applicant's arguments filed November 17, 2006 have been fully considered but they are note deemed to be persuasive and, as required by **M.P.E.P. § 707.07(f)**, a response to these arguments appears below.

IV. ARGUMENTS CONCERNING PRIOR ART REJECTIONS

1ST POINT OF ARGUMENT

20. Regarding Applicant's remarks that Keele does not disclose or describe a virtual tape drive that loads and unloads virtual tape volumes, the Examiner disagrees as Keele clearly discloses [**"MOST records a collection of virtual tapes on optical disks. The emulation process stores "virtual tapes" on the optical disks" (Col. 20, lines 32-41) and explains**

"MOST reduces operator labor due to the automatic mounting and dismounting of virtual tapes" (Col. 20, lines 12-13)].

2ND POINT OF ARGUMENT

21. Regarding Applicant's remark that Keele does not disclose a virtual tape stacker that, for example, sequentially autoloads virtual tape volumes into a virtual tape drive in response to eject commands; the Examiner disagrees [**With respect to this limitation, Keele discloses "MOST reduces operator labor due to the automatic mounting and dismounting of virtual tapes" (Col. 20, lines 12-13)** ***which corresponds to Applicant's argued autoloading*** **"the optical disk 20 is made up of one-thousand-and-twenty-four byte sectors. These sectors can be written and read sequentially from the start of the optical disk through to the end" (Col. 40, lines 64-67);** ***therefore, disclosing writing/storing/reading/accessing virtual tapes in sequential order within optical drives.*** **Furthermore, refer to Figure 5 where Keele illustrates "Tape directory" having virtual tapes stored in sequential order as "virtual tape # 1 (324a), virtual tape #2 (324b)... virtual tape #N (324c)." Keele also discloses (Tape Directory Format Table) which illustrates a "first sector information" having a "first VT" stored within bytes 16-31, and a "second VT" stored within bytes 32-47; therefore, storing virtual tapes in a sequentially within optical disks. Keele discloses "one key press will ready a drive, or rewind or unload a virtual tape" (Col. 36, lines 55-58)** ***as loading/unloading virtual drives*** **and explains "one a virtual tape is mounted from those available on a given disk 20, no other virtual tapes on that disk may be accessed by the mainframe until the first virtual tape is dismounted" (Col. 40, lines 5-11). In (Col. 29, lines 48-60; Col. 36, lines 18-60), Keele teaches having a system of jukeboxes which store optical disks that contain virtual tapes on**

physical slots and explains that one drive (which contains a currently loaded virtual tape) is unloaded at the same time another drive is being loaded; further specifying that optical disks are written sequentially but can be searched/read in sequential or random order. Applicant should note that because Keele is able to mount/dismount any virtual tape written on optical disks defined within Tape Directory (not just a virtual tape sequentially written after a currently loaded virtual tape), and because Keele explains that optical disks are written sequentially and can be accessed sequentially or randomly, Keele's invention is able to load/unload a virtual tape that is next in the sequential order in which virtual tapes are written to optical disks. Keele further provides a greater advantage as Keele's invention is able to load any virtual tape written on optical disks by using random allocation within optical disks. Refer to (Col. 29, lines 48-60; Col. 36, lines 18-60) wherein Keele teaches having a system of jukeboxes which store optical disks that contain virtual tapes on physical slots and explains that one drive (which contains a currently loaded virtual tape) is unloaded at the same time another drive is being loaded wherein optical disks are written sequentially but can be searched/read in sequential or random order].

<u>3RD POINT OF ARGUMENT</u>

22. All other arguments/remarks raised by Applicant are covered within the rejection of claims 16-24 above.

23. All arguments by the applicant are believed to be covered in the body of the office action or in the above remarks and thus, this action constitutes a complete response to the issues raised in the remarks dated November 17, 2006.

V. CLOSING COMMENTS

Examiner's Note

24. Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

V. STATUS OF CLAIMS IN THE APPLICATION

25. The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. § 707.07(i)**:

a(1) CLAIMS REJECTED IN THE APPLICATION

26. Per the instant office action, **claims 16-24** have received an action on the merits and are subject of a final rejection.

a(2) CLAIMS NO LONGER IN THE APPLICATION

27. Claims 14 was cancelled by Amendment dated November 17, 2006.

28. Claims 1-13 and 15 were cancelled by Amendment dated March 5, 2006.

29. For at least the above reasons it is the examiner's position that the applicant's claims are not in condition for allowance.

VI. DIRECTION OF ALL FUTURE REMARKS

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaima Campos whose telephone number is (571) 272-1232. The examiner can normally be reached on Monday to Friday 8:30 AM to 5:00 PM.

IMPORTANT NOTE

31. If attempts to reach the above noted Examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Sanjiv Shah, can be reached at the following telephone number: Area Code (571) 272-4098.

32. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

January 25, 2007

Yaima Campos
Examiner
Art Unit 2185

SANJIV SHAH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100